network, and it doesn't make sense to invest if you can buy it at the cost of a new entrant, or less than the cost of a new entrant, without incurring that risk.

Emily Hoffnar, FCC

Susan?

Susan Baldwin, Economics and Technology, Inc.

I disagree. I believe comparison with CLECs and with interexchange carriers is not an appropriate test for assessing incumbent local exchange carriers' capital costs. CLECs' new entrants have virtually no market share, while ILECs have an entrenched customer base that we just can't ignore as we go into these cost proxy models. CLECs have to deploy capital to serve and to select which customers to serve. And while interexchange carriers at least have more fungible assets, they're not an appropriate benchmark either because unlike the ILECs, they also do not enjoy the monopoly position that the ILECs do. ILECs have a pervasive market share, they have the ability to shift costs among services. They're protected from risk by their sheer size.

Furthermore, they have substantial joint plant and that supports both competitive and monopoly services. They're looking for additional return for an alleged risk, yet they also want to keep all the revenues from those new and competitive services. They shouldn't be allowed to have it both ways. They're seeking to apply the traditional rate of return regulation concept to be

made whole for so-called stranded investment, and at the same time they want unconstrained ability for exploiting their investment for earnings. They should be forced to choose, either to be made whole with strict earnings limits, or earnings flexibility with a price cap plan with a rate of return reevaluated as has been suggested in the access reform, NPRM.

Emily Hoffnar, FCC

Thank you. Larry?

Lawrence P. Cole, GTE Laboratories, Inc.

The relationship between capital costs and the existence of and the risks associated with irreversible investment, obviously the greater the proportion of total investment that a firm makes that is irreversible, and the riskier it is, then the higher the cost of capital. In this context, a facilities-based competitive entrant then will have the most irreversible investment in the loop plant. And as we've seen from three earlier panels and from the staff paper, we know that that's a critical component and it amounts to a lot of money. But I have a problem with the economic scenario. I think as Jim Vander Weide has already pointed out, the scenario that's been posited for us by the Joint Board is one in which the efficient entering competitor builds instantaneously a network to serve 100% of today's now advanced services demand, and likewise starts to get the revenue immediately to begin paying off. That's not the way a

facilities-based entry will occur and I think the cost of capital and the depreciation lives and a lot of the other questions that we've been dealing with in previous panels have to be answered in terms of a realistic and likely economic scenario.

So, the efficient entering competitor is not the incumbent LEC. I don't know what sense it makes to say "let's pretend that we're going to start from ground zero and have the LECs reenter." That does tell us what the replacement cost using today's technology and today's prices would be to rebuild the network, but it doesn't tell us anything about what prices are to be in 1997 or 1998.

Emily Hoffnar, FCC

Thank you. Bob?

Robert Schoonmaker, GVNW Inc./Management

It seems like we have a fairly strong dichotomy of opinion as to what the models are supposed to do. For the last day we've been hearing continually how the models are supposed to recognize the cost of an efficient new entrant into the market, albeit that they have been generally arbitrary made lower by assuming that that market entrant will have 100% of market share when it probably would — any efficient market entrant is very unlikely to assume that they can get 100% of the market share. And now when we get to the capital cost side, suddenly we forget that assumption, or at least some want to, and some want to say, "oh,

this is an incumbent LEC issue." If we're going to ignore the embedded costs of the incumbent LEC, the fact that they have to build networks on a piecemeal basis, over time rather than a one-time network that we ignore the market share issues, and so forth, it seems extremely unfair and inappropriate to now suddenly say that the incumbent LEC's historical capital costs are the appropriate capital costs. In my view, if we're going to look at a model that models investment and expenses as an efficient competitor would enter the market, we certainly have to have capital costs, depreciation expense, that also recognize that same assumption, and those costs are going to be higher than the LECs under a regulated return scenario. So, in my mind, the current LEC returns are definitely inappropriate because they don't reflect a competitor. Probably the IXC rates of return and cost of capital are inappropriate because they have large market shares and they are firmly entrenched in their markets. Perhaps the CLECs might offer a reasonable comparison, other new entrants into highly competitive markets, but we certainly need to keep the assumptions consistent between the expense and investment side and the cost of capital on the depreciation side.

Emily Hoffnar, FCC

Thank you. Labros?

Labros Pilalis, Pennsylvania Public Utility Commission

Expressing my own personal opinion and not that of the Pennsylvania PUC or its staff, I would say here we are trying to — the models are attempting to put together the picture or the prediction of an efficient telecommunications network. And in my mind, that creates the question, if that is the case, why should we assess an additional risk factor for irreversible investments or commonly otherwise called, you know, "stranded costs" because we're looking at the future picture of the network.

Now, if there is a regulatory decision to do so, an appropriate adjustment can be made to the cost of capital figures that are used. In doing so, and from an operational viewpoint, we cannot escape the fact that we are not going to just solely rely on cost of capital figures that have been approved by some regulatory entity in the past, but we are going to attempt to estimate the cost of capital, and especially the cost of common equity capital, on a prospective basis through methods that have traditionally been used, such as the discounted cash flow, DCF method, the capital loss of pricing model, Cap M method, and so forth. In doing so, witnesses, specialists that deal with questions of cost of capital use proxy groups to simulate the risks, not only of a single entity, but the risks of other entities. And at that point, for example, we can differentiate the businesses of the carrier which we are simulating the network, and we segment the business on a competitive and less competitive side. And at that point, we can introduce estimates

of cost of capital that are coming from more competitive type entities such as the CLECs and the IXCs, and thus producing a composite cost of capital that can reflect additional risk factors.

Emily Hoffnar, FCC

Thank you. We'll go to rebuttals now. One minute maximum. Richard?

Richard Clarke, AT&T

What I've heard so far is that nobody has really disputed whether or not the current methodologies of computing the cost of capital do incorporate assumptions about the risk and of irreversible investments. I think the answer is that they do. The question seems to be a bit more "well, is there something wrong about what's really going to happen to the risk of these investments and is the appropriate benchmark that of a new entrant serving the entire market." Now, what I can only observe here is that right now the market competition is what it is, that the LEC does have a very secure share, and if you are a company that has 100% of a local exchange market, you do not face a lot of risk and that that is continuing to be demonstrated by cost of capital analyses. Now as that changes, it may be appropriate to adjust the cost of capital that gets computed into these models, but until that happens, it doesn't seem to me to be appropriate to pre-emptively assume that everything is going to change in the

cost of capital that has to take a quantum step up from what current studies show.

Emily Hoffnar, FCC

Thank you. Ben?

Ben Johnson, Ben Johnson Associates

There's a lot of points, I won't be able to cover them all. I think one thing that's just come out is the significance of market share. I made the point yesterday that I think it's a very important issue that hasn't got the attention it deserves. In terms of a pure modeling question, of the three models, the only one that's specifically set up to deal with it is ours, and I think people can use it to experiment with that question, it's very significant. As to whether this analogy to a new entrant requires you to also scale down to the market share of a new entrant, I don't agree. The concept is the long run. The long run is a concept in which you have a planning horizon in which you can vary the capital mix. You have the same freedom of a new entrant, but you don't necessarily have to scale that network to the size of a new entrant. You can scale it to 100% if that's what the Joint Board wants to do. So I think those are the most important points that were being talked about. There is a confusion here between using a new entrant to understand the long-run concept, and necessarily deciding you have to scale your

network to a small market share. I think you can pick the appropriate market share based on what you're using the data for.

Emily Hoffnar, FCC

Thank you. Jim.

James Vander Weide, Financial Strategy Associates

The purpose of this panel is to discuss the models that we've seen presented. The models are based on a view of the network investment that is forward looking and it is — all of the models agree that that forward-looking investment is considerably less than the embedded investment of the incumbents. It's inconsistent to take a look at forward-looking investment and still talk about the monopolist cost of capital. In the Hatfield Model the capital structure is 55% equity and 45% debt, which is the same capital structure that Judge Green used in 1984 to divest the LECs. Competitive companies have capital structures with 75% equity and 25% debt, and they don't use embedded capital structures, nor do they use allowed rates of return to estimate their cost of capital.

Emily Hoffnar, FCC

Thank you. Susan?

Susan Baldwin, Economics and Technology, Inc.

We need a model that has something to do with reality. The reality is that for the foreseeable future the ILECs will be the ones providing the wires that connect households to the public switch network, either through wholesale or through retail. If we, say, let's use a CLEC's much riskier cost of capital, and again, it was pointed out by Ben, that risk is more in the short term than over a long-term planning horizon, we're going to be giving a huge windfall to the ILECs who are likely to be the major recipients of any universal service fund.

Emily Hoffnar, FCC

Thank you. Larry?

Lawrence P. Cole, GTE Laboratories, Inc.

I think the entry scenario is critical. I think I agree with Susan that we need a realistic scenario. I think what some of the States in their universal service proceedings have done is to say that what they wanted to see cost estimates of was the TSLRIC of providing local basic residential service, or possibly with single line business because they thought they needed to be able to answer some questions about the existence or non-existence of cross subsidy. But they specified a definable economic cost concept. They then, in some instances, mucked it up a little bit with how the TSLRIC studies ought to be done. The set of criteria suggested in the Joint Board decision doesn't

use that terminology, doesn't add up in my opinion to a single coherent economic cost concept, and therefore, I think — it's not clear what they intended was that we look at what the LECs' cost of capital is likely to be in the next two years. And, I think we might be prepared to live with the use of current methods for a while, but you may see a quantum change following whatever happens to the court proceeding that occurs on the 17th.

Emily Hoffnar, FCC

Thank you. Bob?

Robert C. Schoonmaker, GVNW Inc./Management

Where were you yesterday, Susan, when we talking about non-reality in the investment and expense side? I think the question of reality, the Joint Board has stated that the model is supposed to be an efficient network that's built on a one-time basis going forward. That's not a real network. That's not the network the LECs are going to be using and building. If we're going to model this on that basis, we need to model cost of capital on that basis as well, and that's the cost of an entrant, not the cost of the incumbent LEC with their lower cost of capital, with their market share and with their embedded network that's a more costly network than the network we're modeling.

Emily Hoffnar, FCC

Thank you. Labros?

Labros Pilalis, Pennsylvania Public Utility Commission

I'm going to speak from a perspective more from the states and not so much on the Joint Board Recommended Decision. In various universal service proceedings that have taken place, are taking place, or are coming to an end at this point, the states are trying to ascertain a essentially what Mr. Cole described, essentially the cost of basic local exchange service on the basis of an efficient network through the use of the Hatfield BCM and BCM2 Model or Dr. Johnson's Model. In doing so, we are bound — state regulators are bound by the parameters that we're trying to ascertain what support mechanisms will result which will provide payments originally and for some time to come, and for highly monopolistic type services, basic local exchange service, to largely incumbent local exchange carriers. Consequently, the estimation of the associated costs is modeled around incumbent local exchange carriers and the cost of capital has to follow a forward-looking computation along those lines.

Emily Hoffnar, FCC

Any last words?

Richard Clarke, AT&T

I just would like to say one thing about the Hatfield Model. The Hatfield Model does not say "use the currently prescribed rate of returns." What the Hatfield Model has done is we have done rate of return, or cost of capital analyses, and we find that the cost of capital analyses that are done currently seem to match those that are embedded. So, that's the basis for the 10% cost of capital in the Hatfield Model.

Emily Hoffnar, FCC

Thank you.

Robert Schoonmaker, GVNW Inc./Management

And I believe that cost of capital is on embedded LECs, not forward-looking entrants.

James Vander Weide, Financial Strategy Associates

And it's also based on a capital structure that's a book value capital structure which includes embedded costs and not forward-looking costs.

Richard Clarke, AT&T

Well, again, I'm not sure that I would always agree with the characterization of the dichotomy between forward-looking

investment and embedded investment that you've provided. That in particular, yes, there may appear to be a difference there, but we don't know what fraction of this difference is due to an apples-to-oranges comparison, that there's a lot of LEC investment that is not part of the investment that the BCM or the Hatfield Model put out there. It's not for serving narrow band service, it's certainly not for serving universal service. And maybe there's excess investment in the LEC network that was based not on excess depreciation of their capital, but maybe they put too much of it in regulatory gold-plating. We just don't know those —

Emily Hoffnar, FCC

Okay, thank you. Last word?

James Vander Weide, Financial Strategy Associates

Yes. If you want to use embedded costs for cost of capital, then you have to use embedded cost for network investment. If you want to use forward-looking network investment, you have to use forward-looking competitive capital structures and cost of capital.

Susan Baldwin, Economics and Technology, Inc.

I think we need to keep coming back to the services in question that are being modeled in the cost proxy model. And looking forward we're talking about basic local exchange service.

And I think it's entirely appropriate to look at the risk that is associated with the ILECs' provision of basic local exchange service.

Emily Hoffnar, FCC

Okay, let me cut it off. The next question is long, so fasten your seatbelts. In response to the Fourth Further Notice in the Price Cap Proceeding, several commenters submitted estimates of economic rates of depreciation and cost of capital. For example, USTA relied on a study by Jorgenson to estimate economic rates of depreciation. USTA noted that this methodology was consistent with methods employed by the Bureau of Labor Statistics. To estimate the cost of capital, USTA supported using the cost of capital implicit in the U.S. National Income and Product Accounts. By contrast, AT&T supported the use of depreciation rates prescribed by the FCC and costs of capital that were based on LECs' actual costs. Based on the comments filed on the Price Cap Fourth Further Notice, what rates of economic depreciation and costs of capital should be used by a forward-looking cost model? In what ways, if any, should the estimates of economic depreciation rates and costs of capital in the context of estimating total factor productivity be adjusted for use as inputs in a forward-looking cost model? Ben?

Ben Johnson, Ben Johnson Associates

I don't enough about the price cap filings or total factor productivity filings to comment specifically on that part of the question. I will take this opportunity to talk about the middle question here which is "what rates of depreciation and costs of capital should be used?" I think the default values in our model are roughly in the right ballpark. I would be surprised if regulators would ultimately conclude the cost of capital needed to be much higher than this. For example, we're using a 12% cost of equity. That's about the range that most regulators have been finding in recent years in proceedings where it's been contested. As to the lives, they're set forth in our user documentation, or if you open the model. But, for example, on switching, we're at 15 years. On fiber we're at typically 20 to 25 years. That's pretty close to the lives being found by the FCC and the states, it's certainly in the neighborhood of it. I think we're probably just a little bit shorter lives than the Hatfield Model typically. But, again, I think that's one of those judgment calls the Joint Board needs to make, and to some degree, that decision varies with the use of the model. So, a life that you might find appropriate for deciding on the magnitude of a Universal Service Fund might be something different than you would use in a different context.

Emily Hoffnar, FCC

Thank you. Rich?

Richard Clarke, AT&T

In theory, there should be really very little difference between how you calculate the cost of capital and depreciation in these forward-looking models, that they should be based, I agree, on forward-looking costs of those items. Now, I'm not sure a comparison to what was done in the Price Cap Review Docket is completely appropriate because that docket, which is called 94-1, began in 1994. And in 1994, and maybe even still, we are talking about calculating what should be the total factor productivity assigned to access which is set at a regulated price which is greatly in excess of its economic cost. Now, perhaps post-access reform, everything should come into concert at that point. But right now, there's a very large difference.

That being said, I don't think there's a disagreement with this that I think we have some disagreement with what the progression of the USTA proposed depreciation rates and costs of capital are, that in particular to say that the cost of capital should be that in the National Income and Product Accounts is basically to say a LEC is like the same as any other firm, average firm in the industry. But a LEC is not like every other firm in the industry, in U.S. industry. They do face far less risk. This shows up strictly, if nothing else, looking at their bond ratings and yields are below that of the average firm in the — the yield is lower, the quality of the bond is higher than the average firm in the economy. And, in particular, we're not sure exactly the USTA proposed depreciation rates are. That initial

filings seem to indicate, if you look at for cable and wire facilities, that it was somewhere around 40 years and then we've kind of seen it stair-step down in some subsequent filings which it's not clear to us what actual depreciation rates they are proposing.

Emily Hoffnar, FCC

Thank you. Jim?

James Vander Weide, Financial Strategy Associates

The gist of this question is whether you ought to use economic depreciation rates and economic market costs of capital or whether you ought to use regulatory depreciation rates and regulatory allowed rates of return. The distinction is depending on whether you use an embedded rate base or not. In a regulatory setting, one applies the cost of capital and the depreciation rates to a book value rate base. And there's a consistency there, then, between the investment, the depreciation and the cost of capital. In this setting, we're not setting the depreciation rates or applying the depreciation rates and the cost of capital to a book value rate base. We're applying them to a market value rate base of a competitive firm, not a regulated firm of a competitive entrant. That means that it doesn't matter whether the LECs are like the average company or not. For the purposes of modeling, we have to consider them like the average company because that's how we're valuing the

investment. We have to apply economic depreciation rates and market costs of capital to a forward-looking investment. We are allowed to apply regulatory costs of capital and regulatory depreciation to book value or embedded costs of the rate base.

Emily Hoffnar, FCC

Thank you. Labros?

Labros Pilalis, Pennsylvania Public Utility Commission

Yes, a couple of comments. The point we're talking about the regulatory cost of capital, sometimes this is equated with a misnomer. When regulatory agencies do estimate cost of capital, they are doing it on a prospective basis. The analysts that will work in producing DCF or Cap M type estimates, these are more marginal or looking-forward type estimates. They are not historical estimates. That's number one. Number two, when these estimates are produced, the way that Wall Street financial stock type market data is utilized, we end up encapturing risks that are not associated solely with the provision of basic local exchange service, which is a highly type of monopolistic service, whether you have one provider in the market or two. We are also capturing the risk of, let's say, Ameritech and Bell Atlantic having investments overseas. So, in that sense, we may actually overestimate cost of capital figures, but that provides a safety margin for everybody concerned.

Now, in terms of the appropriate use of depreciation rates, definitely this is a very controversial subject, and state regulators not only are interested in the resulting costs relating to the provision of universal service, but I would like to underline the fact that state regulators are also interested in the telecommunications infrastructure investment that takes place within their respective states. And that may also drive individual depreciation policies from state to state.

Emily Hoffnar, FCC

Bob?

Robert Schoonmaker, GVNW Inc./Management

I think, again, we have to look at what the model is intended to model. As Jim said, it's intended to model the cost of an efficient competitor that's entering the market, not the LEC. And again, as with cost of capital, when you look at depreciation rates, the depreciation rates that should be reflected in the model should be those that, number one, reflect a competitive environment; number two, they should reflect a competitive entrant, not an incumbent LEC whose rates are based on historic or depreciation rates or typically based on physical historical lives. And the depreciation lives should be forward looking and based on an economic life, and not on a historical life. In that sense, if you look at the Hatfield depreciation rates, they seem to be based on the kind of assumption that AT&T

is proposing that they be based on regulatory lives and that's inappropriate. Those in the Ben Johnson Model are somewhat better than those in the BCPM, reflect more appropriately lives that a competitive entrant would be expecting rather than those that have been the historical embedded telephone company expectation.

Emily Hoffnar, FCC

Thank you. Larry.

Lawrence P. Cole, GTE Laboratories, Inc.

If you're going to use a cost proxy model, then I certainly agree as an economist that to get the incentives right on a going forward basis in the future at some point the system should be forward looking. The costs that are estimated should be forward looking. And in that sense, the Joint Board recommendation with respect to the cost of capital and depreciation lives is exactly right. The traditional methods of DCF and Cap M can be put in a forward-looking context. One can get from vendors estimates of the betas, forward-looking betas for use in Cap M. One can get growth forecasts from vendors for use for comparable firms. And to get back to one of the earlier questions, you don't have to pick out a particular industry, you can come up with comparable firms to use in calculating the relevant rates.

With respect to the relationship to the TFP proceeding, the focus there was on estimating what historical productivity had

been and so it was not intended to be forward looking. I think the use of the BLS consistent depreciation lives and cost of capital out of the BEA was recommended to be used for the same purposes that we pick the GNPPI. Namely, that it's an estimate that's coming from an independent third-party government agency and doesn't require that you do all kinds of special studies. The objective, it seems to me, is to avoid trying to turn price cap regulation into the perpetuation of cost of service regulation by another means.

Emily Hoffnar, FCC

Thank you. Susan?

Susan Baldwin, Economics and Technology, Inc.

ILECs enjoy a virtual monopoly in the market that's in question with this cost proxy models. And the competition that they face in the near term in the local market is resale. Resale poses absolutely no risk to ILECs because the cost that they avoid are not capital costs. ILECs should be indifferent between wholesale and retail. Furthermore, there's no imminent risk from facilities-based providers. There's no significant in-roads nor is there evidence that there will be significant in-roads in the local market. Furthermore, ILECs have numerous opportunities for horizontal expansions of their market and through these opportunities they can generate all sorts of additional returns on their investment. There's no need for a specific risk

adjustment to the cost of capital in a cost proxy model. Regarding depreciation, the depreciation lives that are set in the cost proxy model should be economically efficient, but that economic efficiency should be driven again by the services in question, not by other services that ILECs may have strategic interests in providing. And coming back to the point where Jim and I seem to disagree so strongly, and others I believe on the panel as well concerning let's use CLECs' cost of capital. Let's use that risky amount. I think it's also important to remember that as is the case with ILECs, CLECs are offering a wide package of services, some of which are basic local exchange and some of which are the competitive advanced services that have nothing to do, again, with the services that are in question in these cost proxy models.

Emily Hoffnar, FCC

Thank you. One minute rebuttals. Ben?

Ben Johnson, Ben Johnson Associates

Yes. Interestingly enough, I think I agree with almost everything Jim said, in principle. The only disagreement seems to be whether or not regulators are doing a reasonably good job of figuring out the economic cost of capital and economic depreciation. And I think they're fairly close to the mark. He apparently thinks they're fairly far off. But the core judgment really which is just look at an item such as copper cable. We're

saying 15 years, they're saying 9 years. Do you truly believe the entire economic value of newly-installed copper will be gone in 9 years? That it can't be used for anything, that it can't be used for ADSL or any other economically useful purpose? I have trouble swallowing that. At 15 years I get comfortable because if you get much farther than that, you are getting into some range in which there is a significant risk that perhaps it will be obsolete. Again, as you go down each of these items, it's ultimately a judgment call. I think the regulators have gotten a lot closer to the correct economic depreciation and cost of capital than he apparently thinks.

Emily Hoffnar, FCC

Thank you. Rich?

Richard Clarke, AT&T

I would largely agree with Ben that we're not talking about huge chasms here. The analyses that we have done for Hatfield on a forward-looking basis have shown the cost of capital to the LECs as being about 10%. My understanding is the ones that Dr. Vander Weide has done for the LECs has suggested that cost of capital is somewhere around 11.4% or in the mid 11's. We're not talking about night and day here, we're talking about fairly small nuances in the methodologies applied for this, and I think some of this, about the cost of capital, is a tempest in a teapot. And issues related to depreciation, I think I'm going to

deal within the next question which is going to specifically deal with that.

Emily Hoffnar, FCC

Thank you. Jim.

James Vander Weide, Financial Strategy Associates

Yes, several things. One on the forwarding-looking nature of the cost of equity estimation methods. First of all, there is evidence that risk has increased. Most betas in the capital asset pricing model are measured using five years of data. If one looks at data over the last year, the betas are virtually 1, as opposed to about 0.7 indicating that they do now have about the risk of the average company. Secondly, although the cost of equity methods are, at least, theoretically forward looking, the capital structures that regulators use are not, those are book value capital structures. The 55-45 is a book value capital structure and it's not a market value capital structure. Economists measure the capital structure based on the market value of equity, not the book value of equity. With regard to the magnitude of the numbers, it's true that AT&T measures the cost of capital at 10, it's not true that I measure it at 11.4. I believe that the estimate in the BCPM Model is very conservative. I really believe that the capital structure should be more like competitive capital structures of 75% equity and

25% debt, and hence that the cost of capital should be closer to 13%.

Emily Hoffnar, FCC

Thank you. Labros?

Labros Pilalis, Pennsylvania Public Utility Commission

Yes, probably the betas have gone close to 1.0 for major telecommunications firms in the United States. The question is, have the betas been driven to a relative high value or essentially paralleling the market because those telecommunications concerns are continuously investing in basic local exchange service, or have they gone to 1.0 because they have departed into ventures such as PCS, PCN, overseas ventures and the like? And I would opine that latter is happening, not the former. Now, as far as the regulators setting up depreciation rates, this is done in the context of traditional cost of service, rate base, rate of return regulation where we look at the book values so that we can keep track of what assets have depreciated, which ones have not. As we go into price cap regulation, and as we grapple with issues of universal service and also as we grapple with the issues of infrastructure investment, definitely regulators will be looking at other methods of assessing depreciation, and they are.